Recurrent Meningitis Due to E. Coli, With Recovery

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A FIVE-WEEK-OLD Caucasian girl, admitted to the Los Angeles County General Hospital Communicable Disease Unit on March 19, 1956, had been perfectly well until she began vomiting after feedings two days before admission. On the day preceding admission, a high fever developed and the patient seemed to be in pain when her legs were moved. There was no history of diarrhea or upper respiratory tract infection and no known exposure to communicable diseases.

On admission, the pulse rate was 140, the respirations 36 per minute, the temperature 101.6°F. rectally, and the body weight 8 pounds. The patient appeared acutely ill and was fretful on extension of the legs. No abnormalities of the skin, the fontanels, the ears and throat or the lungs were noted. There were no signs of meningeal disease. A specimen of spinal fluid was cloudy and contained 5,900 cells per cu. mm.—31 per cent polymorphonuclear cells. One cubic centimeter of spinal fluid reduced six drops of Benedict's solution. There was a 3 plus reaction to a Pandy test. A Gram-stained specimen of the fluid showed Gram-negative rods. A culture of material swabbed from the throat on admission grew Alpha streptococcus viridans, Staphylococcus albus and diphtheroids. Cultures of blood and spinal fluid grew E. coli which were sensitive to streptomycin, aureomycin, chloramphenicol, terramycin, achromycin, neomycin and polymyxin. The blood urea nitrogen content was 15.0 mg. per 100 cc., carbonate content 20 mEq., and potassium 5.6 mg. per 100 cc. The hemoglobin content was 8.5 gm. per 100 cc. of blood, and leukocytes numbered 5,700 per cu. mm. —18 per cent polymorphonuclears.

The infant was treated with intravenous fluids containing potassium penicillin, chloramphenicol and adrenocortical extract, together with the usual vitamins. She also received by clysis 6 molar sodium lactate containing sulfadiazine and sulfamerazine. Five hours after admission, the pulse increased to 160 and the abdomen became tense. A series of epinephrine injections was given, a nasogastric tube was passed, and 0.25 cc. of Parenzyme (trypsin) was given intramuscularly every 6 hours.

In the succeeding days the infant improved clinically. Throughout the hospital course the urine was examined daily for sulfa crystals, and the pH of the urine was maintained on the alkaline side. In an x-ray film of the chest on March 12, the only abnormality was patchy density in the left upper lung. Lumbar puncture was attempted on March 13 but was unsuccessful. On March 17 lumbar puncture was successfully carried out and the pressure was 150 mm. of water. The fluid was clear and xanthochromic. It contained 36 cells per cu. mm.—5 per cent polymorphonuclears. One cubic centimeter of fluid reduced 7 drops of Benedict's solution. Reaction to a Pandy test was 1 plus. An electroencephalogram was unsuccessful because of the patient's moving and crying. Leukocytes in the blood numbered 12,000 per cu. mm.—60 per cent polymorphonuclears. On March 19, the hemoglobin was less than 7.5 gm. per 100 cc. of blood and leukocytes numbered 11,600 per cu. mm.—63 per cent polymorphonuclears. On March 22, the hemoglobin still was less than 7.5 gm. per 100 cc. and the leukocyte content was 8,800 per cu. mm. with 48 per cent polymorphonuclears. On March 23, a specimen of spinal fluid was clear. It contained 45 cells per cu. mm., none of them polymorphonuclear. One cubic centimeter reduced 3 drops of Benedict's solution, and the Pandy test reaction was 1 plus. The hemoglobin content was 7 gm. per 100 cc. of blood and leukocytes numbered 21,200 per cu. mm., 42 per cent of them polymorphonuclear cells. At this time 45 cc. of whole blood was infused through a vein in the scalp. The following day the hemoglobin was 9 gm. per 100 cc. An additional 30 cc. of whole blood was infused and on March 26 the hemoglobin was 10 gm. per 100 cc. Leukocytes numbered 10,800 per cu. mm.—52 per cent polymorphonuclear cells. On March 28, lumbar puncture was carried out and the fluid was clear with 33 cells per cu. mm., none of them polymorphonuclear. The sugar content was normal and the Pandy test reaction was 1 plus. Leukocytes in the blood numbered 9,700 per cu. mm., 36 per cent of them polymorphonuclear. Treatment was stopped on this day.

The child remained afebrile from March 12, 1956, until discharge and continued bright and alert. No neurological impairment was observed.

On April 6 lumbar puncture was attempted but

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was unsuccessful. Leukocytes numbered 10,600 per cu. mm. of blood, 50 per cent of them polymorphonuclear. The patient was discharged April 7 with an appointment for an electroencephalogram in one month. No organisms grew on culture of any of the specimens of spinal fluid obtained during the stay in hospital with the exception of the specimen taken at the time of admittance.

On April 8 the parents returned to the Communicable Disease Unit with the infant, stating that the child had become irritable and vomited the evening feeding on the day she came home from the hospital. She had slept fitfully during the night and at 10:30 next morning the temperature was 102°F.

The patient was readmitted and the temperature at that time was 102°F., the pulse rate 142, and respirations 38 per minute. Except for slight engorgement of vessels in the posterior pharynx, no abnormality was noted in the ears, nose and throat. No nuchal rigidity or other meningeal signs were present. Lumbar puncture was attempted but was unsuccessful. Cisternal puncture was done and the fluid pressure was 110 mm. of water. The fluid was xanthochromic and it contained 1,232 cells per cu. mm.—60 per cent polymorphonuclear cells. One cubic centimeter of fluid reduced 7 drops of Benedict's solution. Reaction to a Pandy test was 1 plus. Hemoglobin content of the blood was 9 gm. per 100 cc. Leukocytes numbered 18,500 per cu. mm.—72 per cent polymorphonuclears. The urea nitrogen content was 24 mEq., carbonate 23 mEq. and potassium 6.1 mEq.

Chloramphenicol, streptomycin and sulfadiazine were given by vein and sulfamerazine by clysis. Two days later, on April 10, the child was reported to have had recurrent episodes of unconsciousness with upward-rolling of the eyes, each episode lasting 5 to 30 seconds. One such episode was accompanied by a tetanic convulsion. The temperature at this time was 100.8°F. rectally and the pulse rate 180. Chloral hydrate was given per rectum, which controlled the convulsive seizures. On April 11, the patient became afebrile and had no more convulsions.

A lumbar puncture was performed April 13, and the fluid was xanthochromic and "ground glass" in appearance. The pressure was 40 mm. of water and there were 49 cells per cu. mm., none of them polymorphonuclear. The sugar content was normal and the Pandy reaction was 1 plus. On April 16, the infant was given 150 cc. of whole blood in a vein in the scalp. Five days later the hemoglobin content was 14 gm. per 100 cc. of blood. Leukocytes numbered 6,100 per cu. mm.—24 per cent polymorphonuclears. The following day lumbar puncture was done and the fluid was clear. It contained 23 cells per cu. mm., none of them polymorphonuclear. The sugar content was normal and the Pandy test reaction was 1 plus. Therapy was discontinued and the patient remained afebrile and continued to gain weight. On May 15, lumbar puncture was done again. The fluid was clear, the cell content 8 per cu. mm., with no polymorphonuclear cells, the sugar content normal. There was faint reaction to a Pandy test. The hemoglobin content of the blood was 12 gm. per 100 cc., and leukocytes 6,300 per cu. mm., with 15 per cent polymorphonuclears.

No organisms grew on cultures of all the spinal fluid specimens obtained during the second period of hospitalization. The patient was discharged on May 16.

SUMMARY

A case of meningitis due to E. coli, with recurrence and recovery, is presented.

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Tetanus with Complete Recovery

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A SIX-YEAR-OLD Mexican boy fell while playing and struck his abdomen. Next day he began to have severe abdominal pain and rigidity. In the succeeding two days the condition became increasingly severe. Generalized stiffness developed and the patient could not open his mouth. He was then (four days after injury or three days after symptoms were first noted) taken to a physician who referred him to the Communicable Disease Unit of the Los Angeles County General Hospital on March 3, 1956, on suspicion of poliomyelitis, meningitis or neglected acute abdominal disease.

When the history was taken it was noted that the boy was accustomed to playing barefooted and had never received immunization of any kind.

The patient appeared to be acutely ill. He could open his jaws only about a half inch. There was pronounced abdominal muscle rigidity and stiffness of the neck, and moderate generalized muscular rigidity made it difficult to flex the arms and legs. In addition the patient had multiple small splinters and pieces of dirt ground into the skin of both hands and feet, an infected granulating lesion on the right great toe and another open granulating lesion on the left index finger.

A specimen of spinal fluid was obtained immediately. It was clear, contained 3 cells per cu. mm., one of them polymorphonuclear, and a normal amount of sugar. A Pandy test reaction was negative.

A diagnosis of tetanus was made on the basis of clinical evidence, and therapy was started within a few minutes after the patient's arrival. He was scrubbed with soap and water and skin and intravenous tests for sensitivity to tetanus antitoxin were carried out. Administration of 40,000 units of tetanus antitoxin in normal saline solution intravenously was begun. In addition 40,000 units of antitoxin was given intramuscularly in each buttock, 10,000 units around the left ankle, 10,000 units around the left wrist, and 20,000 units around the right ankle. Surgical debridement of the two larger

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